



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/787,196	04/26/2001	Ichiro Hirao	55729	6079

21874 7590 10/06/2004

EDWARDS & ANGELL, LLP
P.O. BOX 55874
BOSTON, MA 02205

EXAMINER

HENRY, MICHAEL C

ART UNIT	PAPER NUMBER
----------	--------------

1623

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/787,196

Applicant(s)

HIRAO ET AL.

Examiner

Michael C. Henry

Art Unit

1623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,6-8,11 and 12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-4,6-8,11 and 12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____ | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

The following office action is a responsive to the Amendment filed, 05/03/04.

The amendment filed 05/03/04 affects the application, 09/787,196 as follows:

1. Claims 1-4,6 and 11 have been amended. Claims 5,9 and 10 have been canceled.

Claims 13-40 have been withdrawn. This leaves claims 1-4, 6-8,11 and 12 to be examined on the merits.

2. Applicant responds to the rejection under 35 USC 112 and 102 by amending and canceling said claims.

The responsive to applicants' arguments is contained herein below.

Claims 1-4, 6-8 and 11-40 are pending in application

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4,6-8,11 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1 and 4 recite the phrase "a group having capable of hindering base pairing".

However, the claim is indefinite because it is unclear which group(s) is capable of hindering base-pairing. More specifically, this phrase is vague and indefinite and, one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Furthermore, it is unclear whether or not it is imperative that the group(s) has to hinder base-pairing, since the group only has to be "capable of hindering base-pairing".

Art Unit: 1623

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4,6-8, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rappaport (US 5,126,439).

In claim 1, applicant claims "A method for forming a selective base pair, the method comprising the step of contacting (i) a nucleic acid having, as a base, 2-aminopurine, which is substituted at position-6 by a group capable of hindering base-pairing between said 2-aminopurine and thymidine, uridine or cytosine, and (ii) with a nucleic acid having 2-oxo or 2-hydroxy pyridine as a base." Claims 2-4 and 6-8 are drawn to a method of claim 1 involving specific groups and groups with specific capabilities. Claims 11 and 12 are drawn to said method wherein the base pairs can be recognized by specific polymerases.

Rappaport discloses a method of forming a selective base pair, the method comprising contacting nucleic acid (DNA) having as base, the 2-aminopurine (6-thioguanine), which is substituted at position-6 by a group (-SH) capable of hindering base-pairing between said 2-aminopurine (6-thioguanine) and thymidine, uridine or cytosine, with a nucleic acid having 5-methyl-2-pyrimidinone (see example 3, col. 17, line 40 to col. 19, line 37). Rappaport discloses that the base pairs can be recognized by DNA polymerases (see col. 19, lines 14-37).

Art Unit: 1623

The difference between applicant's claimed method and the method of Rappaport is that Rappaport does not specifically exemplify the use of a 2-oxo or 2-hydroxy pyridine as to form a base pair. However, Rappaport discloses a genus that encompasses, fully embraces or conforms to the structure of 2-oxo or 2-hydroxy pyridine (see claim 1 especially the structure in col. 20). This structure is equivalent to 2-oxo or 2-hydroxy pyridine when $X = \text{carbon}$, $R_3 = \text{O}$, $R_4 = R_5 = \text{H}$). Furthermore, Rappaport discloses that the said base can be used to form a double stranded genetic sequence consisting of DNA (see claim 1).

It would have been obvious to one having ordinary skill in the art, at the time the claimed invention was made to have used the method of Rappaport to form a selective base pair, with 2-aminopurine such as 6-thioguanine and any base suggested by Rappaport such as 2-oxo or 2-hydroxy pyridine to form a double stranded genetic sequence of a DNA duplex, since Rappaport disclosed that said bases can be used to form artificial base pairs.

One having ordinary skill in the art would have been motivated to use the method of Rappaport to form a selective base pair, with 2-aminopurine such as 6-thioguanine and any base suggested by Rappaport such as 2-oxo or 2-hydroxy pyridine to form a double stranded genetic sequence of a DNA duplex, since Rappaport disclosed that said bases can be used to form artificial base pairs.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Henry whose telephone number is 571-272-0652. The examiner can normally be reached on 8:30 am to 5:00 pm; Mon-Fri. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be

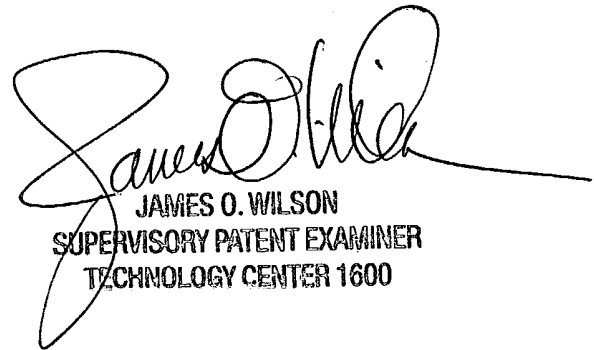
Art Unit: 1623

reached on 571-272-0661. The fax phone number for the organization where this application or proceeding is assigned is 703 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-1235.

MCH

September 29, 2004.



JAMES O. WILSON
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600